

A community study of diabetes in Oxfordshire

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SUMMARY. A mailed questionnaire was used to identify people with diagnosed diabetes in a population of approximately 14,000. A response rate of 90 per cent was obtained and the prevalence of diabetes was found to be 0.8 per cent. The questionnaire method compared favourably with other methods of identifying diabetics in the area.

Eighty-two diabetics were interviewed and examined for diabetic complications and 55 of these completed a questionnaire on their attitudes to diabetes and its care.

The medical records of all 108 diabetics identified were examined. A greater proportion of patients who attended either a general practice mini-clinic or a hospital diabetic clinic had examination for complications recorded than patients attending their general practitioner in ordinary surgery time. Patients attending on demand were seen less often and had fewer observations recorded when they came.

Comparison of measures of control between hospital and general practice patients showed that hospital patients tended to be more tightly controlled even though most were on insulin and likely to have more severe diabetes.

Half of non-insulin diabetics and a quarter of those on insulin considered that their diabetes should be managed solely by their general practitioner.

This was a pilot study and caution should be exercised in interpreting results from comparatively small numbers. The study has since been extended to a larger population.

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Introduction and aims

FOR many years it has been customary for patients with diabetes mellitus to attend hospital clinics. These clinics are often overcrowded, with long waiting times and inadequate time for patients in need of specialist care—for example, unstable or pregnant diabetics and/or those with complications. In some areas the care of those with uncomplicated diabetes has been undertaken by general practitioners, thus relieving the load on hospital clinics (Malins and Stewart, 1971; Thorn and Russell, 1973; Hill, 1976; Wilkes and Lawton, 1980). The treatment of patients discharged from hospital care to practices without adequate organization has been shown by Wilkes (1980) to be far from satisfactory.

Screening studies have shown how many diabetics a community may contain (Harkness, 1962; College of General Practitioners, 1962, 1963; Butterfield, 1964), but studies on the prevalence of complications of diabetes have been based on hospital clinics (Donovan, 1978) or individual practices (Doney, 1976; Kratky, 1977), which may not be representative of the population as a whole. It is evident from these studies that complications sometimes go undetected or unrecorded.

A study in areas of the Oxford region aimed to:

1. Determine the prevalence of diagnosed diabetes and of diabetic complications in the area.
2. Compare different ways of organizing care and examine their relationship to control and detection of complications.
3. Explore the attitudes of diabetics to their condition and its management.

We report the methods used in a pilot study conducted in a market town and village near to Oxford with a combined population of about 14,000, and compare ways of organizing care for diabetics in the area. Four general practices cover most of the area of study. In one

Table 1. Age, duration of diabetes and treatment for patients receiving the various forms of care.

Type of care	Mean age (years \pm 1 SD)	Mean duration of diabetes (years \pm 1 SD)	Treatment groups			Total number of patients
			Insulin	Tablets	Diet alone	
Hospital	42 \pm 19	10 \pm 7	25	7	5	37
All GP care	67 \pm 13	8 \pm 7	12	30	29	71
GP mini-clinic	63 \pm 13	10 \pm 8	5	5	11	21
Regular GP care	67 \pm 13	8 \pm 6	3	12	6	21
On-demand GP care	71 \pm 12	7 \pm 5	4	13	12	29

Table 2. Consultation frequency in the different care groups of diabetic patients.

Care groups of patients	Percentage of group seen within set intervals		
	12 months	2 years	5 years
Hospital (n = 37)	94	97	100
GP mini-clinics (n = 21)	86	95	100
Regular GP care (n = 21)	95	100	100
On-demand GP care (n = 29)	75	86	100

practice a diabetic mini-clinic offering regular appointments is run by one partner but almost as many diabetics are seen in ordinary surgery time by other partners. In all practices some patients are seen regularly and some on demand from the patient.

Methods

Every household in the chosen area was sent, via a household delivery service, a letter explaining the purpose of the study, a brief questionnaire and a reply paid envelope. The questionnaire asked the number of residents in the house and the name of any person with diagnosed diabetes. Advertising by poster, newspaper articles and local radio preceded the circulation. Replies were checked against the electoral role, and reminders addressed personally were mailed to non-responders at two months and five months after the initial circulation.

A separate list of diabetics in the area was compiled from existing practice disease registers, from hospital activity analysis reports and the memories of members of practice teams. This compilation was compared with the list of diabetics identified by the questionnaire. Those diabetics who were willing and available were interviewed and examined by one of us (CD) using a standard interview format to detect symptoms and signs of complications of diabetes and to ask questions about present methods of care for their diabetes. Examination included measurement of visual acuity, fundoscopy through dilated pupils wherever possible, and a resting electrocardiogram. Blood was taken for measurement of random blood glucose and HbA_{1c}. Urine was tested for protein. Before the interview, patients were sent a questionnaire on their views about diabetes and methods of care.

General practice and hospital records were examined to determine whether care was on a regular or 'on-demand' basis and when various aspects of diabetes had last been recorded. Patients under general practice (GP) care were considered in three groups for comparison: those attending a GP mini-clinic, those offered regular appointments though not in a mini-clinic (regular GP care) and those attending on demand (on-demand GP care). Record was made of six previous blood glucose measurements for each patient where available and used as one measure of previous control. (This apparently crude measure of control has previously been shown to be of value in epidemiological studies of diabetes (Dornan, 1982).) Results are expressed as mean \pm 1 standard deviation and statistical analysis was performed using Student's t test.

Results

Questionnaire

The response rate to the first mailing of the questionnaire was 68 per cent. This increased to 86 per cent after the first reminder and 90 per cent after the second. Eighty-seven diabetics identified themselves after the first mailing, a further 17 after the second, and one additional reply was received after the third mailing.

The list compiled from practice disease registers, hospital records and the memories of practice teams revealed a further eight diabetics not identified by the questionnaire. Four of these people had responded to the questionnaire as non-diabetics; it was learned, on enquiry, that three felt that their diabetes was too mild to be of sufficient interest to the study, and one felt his diabetes had been cured after a loss of 31.75 kg (5 stones) in weight. The other four did not return any questionnaire. Use of methods other than the questionnaire would have identified only 76 diabetics.

Of the population responding to the questionnaire (12,842) 109 were diabetic, giving a prevalence of diagnosed diabetes of 0.8 per cent. There were four diabetics also known to be in the non-responding population (estimated at 1,450) but this does not significantly influence the overall prevalence estimate.

Organization of care

Eighty-two diabetics were interviewed, the remainder being unwilling or unavailable. Four patients who died

Table 3. Frequency with which various measurements were made in the different care groups.

Care group	Percentage of group with feature recorded in last 2 years					
	BP	Weighed	Blood glucose measured	Eyes examined	Foot pulses examined	Examined for peripheral neuropathy
Hospital	85	94	97	86	69	67
GP mini-clinic	95	91	95	86	85	90
Regular GP care	86	63	95	30	26	25
On-demand GP care	59	36	55	35	17	13

Table 4. Comparison of measures of control between hospital- and GP-treated patients.

Measure of control	Numbers of patients		Comment
	Hospital	GP	
Random glucose ≥ 10 mmol/l	6 (25%) <i>n</i> = 24	30 (57%) <i>n</i> = 53	All treatment types. Children excluded
Mean previous glucose (mmol/l)	9.2 \pm 2.2 <i>n</i> = 26	10.5 \pm 2.7 <i>n</i> = 37	Diet treatment excluded. <i>P</i> = 0.02
Mean HbA _{1c} (%) (normal range 4.8–8.7%)	10.5 \pm 2.2 <i>n</i> = 20	11.5 \pm 3.2 <i>n</i> = 26	Diet treatment excluded. Children excluded. <i>P</i> = 0.16

before they could be interviewed were excluded from the analysis. The results were based on information from the medical records (108 patients) and from the interview (82 patients).

Age, duration of diabetes, type of care and treatment are shown in Table 1; the hospital group had a lower mean age (42 \pm 19 years) than the GP groups (67 \pm 13 years) and were predominantly insulin-treated patients. Table 2 shows the percentage of each group of patients who had been reviewed within the time intervals of one year, two years and five years; the on-demand GP care group had consulted at about the rate expected of the average patient (RCGP, 1973). Table 3 shows the percentage of patients whose blood pressure, weight and blood glucose had been recorded and who had been examined for complications of diabetes within the previous two years. Recording of all features was most complete in the GP mini-clinic group, probably because a separate card designed specifically for the clinic is used to record observations. For those attending hospital, it appeared that measurements undertaken by nursing or technical staff (weight and blood glucose) were always done but not so for those observations left to doctors. Of the four insulin-treated and 13 tablet-treated patients consulting on-demand, four had not seen a doctor for over two years and for 10 there was no record of a blood glucose measurement within the previous two years.

The prevalence of diabetic complications and their detection will be reported in full on completion of the main study, when more patients have been examined. However, some findings relating to retinopathy are

reported here. Four of 82 patients whose eyes were examined by CD were found to have previously undetected retinopathy: three had appreciable background retinopathy and one had proliferative retinopathy subsequently treated with photocoagulation. Two of these patients were under hospital care and two under regular GP care, and although their fundi had been examined recently the pupils had not been dilated.

At this stage of the study, analysis of the measures of control has been confined to a comparison of hospital patients and all the GP patients combined. Patients on dietary treatment alone were excluded from the last two analyses as many had mild diabetes. Results are shown in Table 4. Hospital patients are more tightly controlled despite being mainly insulin-treated patients who would be expected to be more difficult to control.

The questionnaire concerning the patients' attitudes was completed by 55 (67 per cent) patients. Results are summarized in Table 5.

Discussion

Questionnaire

The response rate of 90 per cent to a mailed questionnaire was considered to be good. Oppenheim (1966) quotes rates of 40–60 per cent for mailed questionnaires in general. In the study in Essex (Harkness, 1962) a response of 96.7 per cent was obtained after two mailings. It may be that a familiar name on the letter is important: in the Essex study the second letter was signed by the recipient's general practitioner. In the

Table 5. Summary of response to attitudes questionnaire. Patients were asked to choose from a number of set responses—only some of these are shown below.

Question	Response	Percentage		
Do you feel worried about having diabetes?	'Not at all' or 'Not very worried'	70		
When you compare diabetes with bronchitis, how serious do you think diabetes is?	'Less' or 'Very much less serious'	54		
What do you think are the benefits of keeping to your treatment?	'You will feel better'	True 94		
	'It will avoid complications in the future'	True 70		
What sort of effect do you think diabetes has had on the following aspects of your life?	Career: 'Very little' or 'No effect at all'	83		
	Personal life: 'Very little' or 'No effect at all'	88		
	Social activities: 'Very little' or 'No effect at all'	89		
Treatment groups (percentage)				
Who, apart from yourself, do you think should look after your diabetes?	Insulin (n = 17)	Tablet (n = 19)	Diet only (n = 14)	
	GP and hospital	47	26	43
	GP only	24	68	50
	Hospital only	29	5	—
	Nobody else	—	—	7
How often do you think you should be seen by a doctor about your diabetes?	'Only when you feel you need advice'	40		
Do you think you are given enough information about your diabetes?	'Enough'	62		

present study the letter was signed by a town general practitioner and there was a higher response rate from the town than from the village. The prior publicity also probably helped, especially in a geographically well-defined community.

The figures suggest that the second mailing was important to cover those missed unintentionally during the first mailing and to identify some of those reluctant to reply initially. The value of the third mailing was doubtful. The detection of eight more diabetics from other sources showed that the questionnaire method alone was inadequate, although a change in wording of the questionnaire might have picked up the mild diabetics.

We consider this to have been a successful method of detecting the great majority of people with diagnosed diabetes in a community in the absence of complete practice disease registers. An alternative would have been to look through all general practice records for the area, which would have been a daunting prospect and raised questions of confidentiality. Methods using checks on prescriptions would not include those diabetics on dietary treatment alone, and recording at consultations would take several years to achieve a complete result.

Organization of care

At the conclusion of this pilot study it is not possible to relate differences in the type of care to outcome for the

patient apart from the observation that hospital patients are more tightly controlled. It does appear that some diabetic patients under GP care do not have a record of having been examined for complications of the disease and in some cases basic measurements such as blood glucose are not available. Perhaps doctors hold different views about the importance of detection of complications and about the relevance of tight control of blood glucose to good outcome. On the latter subject there is still debate among diabetic specialists (Cahill *et al.*, 1976; Ingelfinger, 1977; Siperstein *et al.*, 1977). Further discussion of these matters is beyond the scope of this paper, but if one believes that a complete, regular examination for complications is important for all diabetic patients, then it is encouraging to know that this can be achieved in general practice and that a record card is a useful aid. The mini-clinic setting may also be important.

The apparent enthusiasm of many diabetics for the general practitioner's involvement in their care is encouraging, although it seems that some patients also need to be convinced of the benefits of regular review.

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Pulverized kidney stones

The technique of pulverizing renal stones by externally applied shock waves is reported. The patient is given continuous epidural anaesthetic and lowered into a special bath fitted with a shock-wave generator. This apparatus is known as a lithotripter.

Source: Chaussy, C. L., Schmiedt, E., Jocham, D. *et al.* (1982). First clinical experience with extracorporeally induced destruction of kidney stones by shock waves. *Journal of Urology*, 127, 417-420.

Smoking and peptic ulcers

Cigarette smoking interferes with therapeutic attempts to heal peptic ulcers. A study has shown that cigarette smoking reverses the inhibition of nocturnal gastric secretion produced by the H₂-receptor antagonists cimetidine and ranitidine. The authors recommend that smokers should particularly refrain from smoking after having taken their nocturnal dose of antisecretory drug.

Source: Boyd, E. J. S., Wilson, J. A. & Wormsley, K. G. (1983). Smoking impairs therapeutic gastric inhibition. *Lancet* 1, 95-97.

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